

PATENT SPECIFICATION

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1 324 514

DRAWINGS ATTACHED

1 324 514

(21) Application No. 34560/70 (22) Filed 16 July 1970

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(51) International Classification G03B 1/60 G03G 15/00

(52) Index at acceptance

G2H 3C7 3C8 3CY 3Y 4 6B 6Y
B8R 8D1B1 8F1 8G1E 8G2B 8G3E 8G3X

(19)



(54) PHOTOCOPYING APPARATUS

(71) I. KEITH DENIS LEWIS BERESFORD, a British subject of Chancery House, 53-54 Chancery Lane, London, WC2A 1QU, do hereby declare the invention, which was communicated from CANON KABUSHIKI KAISHA, a Japanese Company of 30-2, 3-chome, Shimomaruko, Ohta-ku, Tokyo, Japan, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to photocopying apparatus.

The known apparatus uses sheets of copying paper having a predetermined size such as standard format DIN A4. This format cannot be sufficiently utilized when an original is copied into a reduced size such as standard format DIN A5 or when only originals of standard format DIN A5 are copied into the same size. This leads to a high cost of the resultant copies.

There is a further apparatus in which sheets of paper may be delivered from cassettes. These cassettes are replaceable. This enables paper sheets of small format to be fed when copies of small size are desired. However, replacement of such cassettes takes much trouble and much time.

The present invention provides a photocopying apparatus capable of forming copies in various sizes, comprising means for drawing web from a roll thereof, means for measuring the length of web drawn from the roll, means selectively setttable to represent any of a predetermined plurality of values of length of web, and control means for comparing the measured length with a value set in said selectively setttable means and for both causing a cutter to cut the web

reference to the accompanying drawings. 50

Figure 1 is a schematic view showing a portion of the apparatus according to the present invention.

Figure 2 is a bird's-eye view of the portion shown in Figure 1. 55

Figure 3 is a detail showing the manner in which paper is cut.

Figure 4 is a detail of the roll knife.

Referring to Figure 1, a web of photo-sensitive paper 2 is drawn from a supply roll of paper 1 by a pair of rollers 3 and 4. The roller 4 is driven from a motor 5 through a magnetic clutch 6. A dancer roller 7 is disposed between the roller 4 and the roll of paper 1. Cutter means 8 and 9 are provided rearwardly of the rollers 3 and 4. A further pair of rollers 10 and 11 are provided to feed the paper into the apparatus. The roller 4 is connected to an apertured disc 12. A source of light 13 (Figure 2) emits light which passes through the apertures in the disc 12 and a photocell 14 receives the resultant pulses of the light. The pulses reach a counter Z through a pulse former 15. The counter Z is connected to a preselector V, which can be set for preselection of the size of paper-sheet. When the counter Z reaches a preselected value set in V, a relay R is closed. The relay R is connected to the counter Z through a conductor 16 so as to reset the counter to zero. The electric circuit of the clutch 6 is cut off through a conductor 17, thus opening the clutch and stopping the drive roller 4. In addition, the relay R operates the cutter means 8 and 9. In this case the cutter means 9 is a cutter roll as shown in Figure 4. From Figure 1 it is seen that when the relay R is energized, the switch 18 is closed and thus the electric 90

SPECIFICATION NO 1324514

By a direction given under Section 17 (1) of the Patents Act 1949 this application proceeded in the name of CANON KABUSHIKI KAISHA, a Japanese Company of 30-2, 3-Chome, Shimomaruko, Ohta-Ku, Tokyo, Japan.

THE PATENT OFFICE

(Price 4/6)

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The known apparatus uses sheets of copying paper having a predetermined size such as standard format DIN A4. This format cannot be sufficiently utilized when an original is copied into a reduced size such as standard format DIN A5 or when only originals of standard format DIN A5 are copied into the same size. This leads to a high cost of the resultant copies.

There is a further apparatus in which sheets of paper may be delivered from cassettes. These cassettes are replaceable. This enables paper sheets of small format to be fed when copies of small size are desired. However, replacement of such cassettes takes much trouble and much time.

The present invention provides a photocopying apparatus capable of forming copies in various sizes, comprising means for drawing web from a roll thereof, means for measuring the length of web drawn from the roll, means selectively settable to represent any of a predetermined plurality of values of length of web, and control means for comparing the measured length with a value set in said selectively settable means and for both causing a cutter to cut the web to the required length and causing cessation of drive to said means for drawing web when the measured length becomes equal to the set value.

Thus, copies of different standard formats can be obtained without changing sheets of copying paper.

The invention will now be described with

[Price 25p]

reference to the accompanying drawings. 50

Figure 1 is a schematic view showing a portion of the apparatus according to the present invention.

Figure 2 is a bird's-eye view of the portion shown in Figure 1. 55

Figure 3 is a detail showing the manner in which paper is cut.

Figure 4 is a detail of the roll knife.

Referring to Figure 1, a web of photo-sensitive paper 2 is drawn from a supply roll of paper 1 by a pair of rollers 3 and 4. The roller 4 is driven from a motor 5 through a magnetic clutch 6. A dancer roller 7 is disposed between the roller 4 and the roll of paper 1. Cutter means 8 and 9 are provided rearwardly of the rollers 3 and 4. A further pair of rollers 10 and 11 are provided to feed the paper into the apparatus. The roller 4 is connected to an apertured disc 12. A source of light 13 (Figure 2) emits light which passes through the apertures in the disc 12 and a photocell 14 receives the resultant pulses of the light. The pulses reach a counter Z through a pulse former 15. The counter Z is connected to a preselector V, which can be set for preselection of the size of paper sheet. When the counter Z reaches a preselected value set in V, a relay R is closed. The relay R is connected to the counter Z through a conductor 16 so as to reset the counter to zero. The electric circuit of the clutch 6 is cut off through a conductor 17, thus opening the clutch and stopping the drive roller 4. In addition, the relay R operates the cutter means 8 and 9. In this case the cutter means 9 is a cutter roll as shown in Figure 4. From Figure 1 it is seen that when the relay R is energized, the switch 18 is closed and thus the electric circuit leading to an electromagnet 19 is closed. Thereupon a capacitor 20 discharges. The core of magnet 19 is thereby moved to move a lever 21, which rotates the roller 9 whose cutting edge 9' cuts the paper web. 95

A conductor 22 extending into the incandescent lamp 13 is provided with a safety

FIG. 1

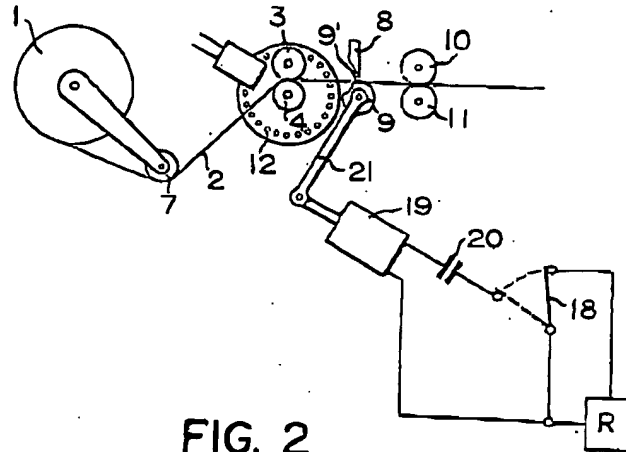
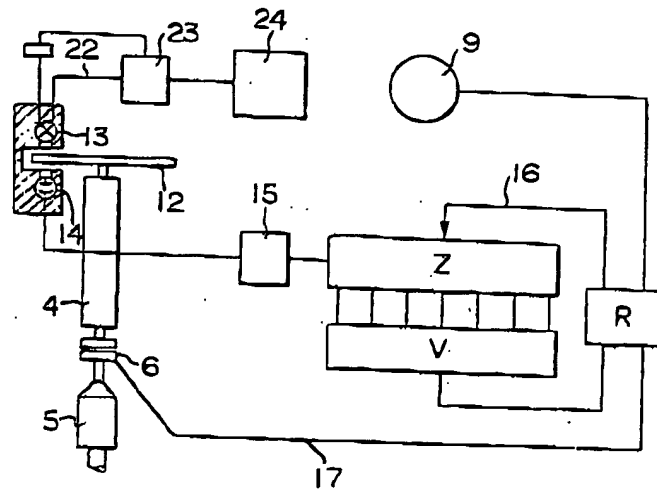


FIG. 2



1324514

COMPLETE SPECIFICATION

2 SHEETS

*This drawing is a reproduction of
the Original on a reduced scale*

Sheet 2

FIG. 3

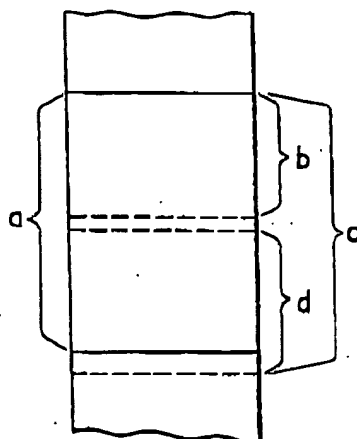
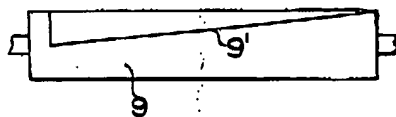


FIG. 4



switch 23. This controls a power source 24 for the entire apparatus so that if the current to the incandescent lamp 13 is cut off the power source 24 is disconnected. Therefore it is not possible for failure of the incandescent lamp, and resulting stopping of the counting action of the counter Z to prevent it from reaching the preselected value, to cause idle rotation of the roll of paper 1.

The roller knife cuts the web of paper into size *a* or *b* (Figure 3). The size *a* corresponds to the longer side of the DIN A4 format and the size *b* corresponds to the shorter side of the DIN A5 format. Alternatively, the roller knife can cut the web of paper into sizes *c* and *d*, which correspond to the United States standard formats. The preselected value V determines the size into which the web of paper is cut.

The actual measurement counter Z automatically returns to its zero position upon completion of each cutting cycle.

WHAT I CLAIM IS:—

1. A photocopying apparatus capable of forming copies in various sizes, comprising means for drawing web from a roll thereof, means for measuring the length of web drawn from the roll, means selectively settable to represent any of a predetermined plurality of values of length of web, and control means for comparing the measured length with a value set in said selectively settable means and for both causing a cutter to cut the web to the required length and causing cessation of drive to said means for drawing web when the measured length becomes equal to the set value.

2. An apparatus as defined in claim 1, wherein said means for comparing is operable to energize a relay which causes said

operation of said cutter and said cessation of said drive.

3. An apparatus as defined in claim 2, wherein said means for drawing includes a drive roller which operates said measuring means.

4. An apparatus as defined in claim 3, wherein said measuring means includes a pulse generator driven by said drive roller and said comparing means includes a pulse counter.

5. An apparatus as defined in claim 4, wherein said pulse generator includes an apertured disc driven by said drive roller and photoelectric means operable to sense said apertures to produce said pulses.

6. An apparatus as defined in claim 3, wherein said drive roller is connected to a drive motor through a clutch.

7. An apparatus as defined in claim 6, wherein said relay operates said clutch.

8. An apparatus as defined in claim 4, wherein said pulse generator includes a source of light having an electric circuit provided with a switch adapted to electrically disable apparatus if said source of light fails.

9. An apparatus as defined in claim 2, wherein said cutter means comprises a roll knife controlled by a magnet.

10. An apparatus as defined in claim 9, wherein said relay operates said magnet through a capacitor.

11. Photocopying apparatus substantially as described with reference to the accompanying drawings.

R. G. C. JENKINS & CO.,
Chartered Patent Agents,
Chancery House,
53/64 Chancery Lane,
London, WC2A 1QU.
Agents for the Applicant.

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